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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,550	09/26/2003	Kaoru Uchida	17076	3731

23389 7590 01/23/2007
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EXAMINER	
LIEW, ALEX KOK SOON	
ART UNIT	**PAPER NUMBER**
2624	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/672,550	UCHIDA, KAORU	
	Examiner	Art Unit	
	Alex Liew	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 – 3, 5, 6, 8, 9, 11 – 14, 16, 17, 19, 20, 22 – 25, 27, 28, 29, 30 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima (US pat no 6,094,499) in view of Bjorn (US pub no 2001/0040987).

With regards to claim 1, Nakajima discloses a fingerprint authentication method comprising

a first step of collating features of input data based on a fingerprint input by an user with features of enrolled data (see col. 9 lines 18 – 27) and

a third step of authenticating the input data according to results of said first step and said second step wherein a second step is done by the use of a spatial frequency analysis of an input image represented by the input data (see col. 9 lines 28 – 38 – the Fourier image data has positional index using m which indicates frequencies at different position – spatial, see col. 10 lines 56 – 62 – authentication of the fingerprint image is done using correlation method, when match is found, the authentication method will end).

But does not disclose a second step of judging whether the input data are proper for authentication. Bjorn discloses a step of judging whether the input data are proper for authentication (see fig 5 – 515, 520 and 530 – the system detects if the fingerprint is within the imaging sensor by taking images of the fingerprint and background). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to include judging whether the input data are proper for authentication because to properly align the finger to the image sensor to get the best fingerprint image possible to prevent any errors when authenticating the individual trying to access a secure area and improving recognition process.

With regards to claim 2, Nakajima discloses a fingerprint authentication method as claimed in claim 1, wherein

a forth step of deciding a rectangular observation area on the input image (see fig 1A – the rectangular observation area is chosen to be surrounding the fingerprint image),

a fifth step of finding Fourier transformed image from the input image (see fig 1B and col. 11 lines 35 – 38 – fingerprint image data in fig 1B is the Fourier image data of the fingerprint image in fig 1A),

a sixth step of calculating discriminative values on the basis of the Fourier transformed image, said discriminative values representing features of the spatial frequency distribution of brightness of the input image (the Fourier transform of an

image represents the magnitudes of the intensity / brightness at different levels frequency).

But does not disclose deciding whether the input data are proper for the authentication or not on the basis of the discriminative values. However, Nakajima uses Fourier fingerprint image data to authenticate the user, implying that the fingerprint image is already proper to be authenticated. Again, Bjorn discloses a step of judging whether the input data are proper for authentication (see fig 5 – 515, 520 and 530 – the system detects if the fingerprint is within the imaging sensor by taking images of the fingerprint and background), with motivation provided in claim 1.

With regards to claim 3, Nakajima discloses a fingerprint authentication method as claimed in claim 2, wherein said step is done by the use of one or more discriminants and corresponding discriminative coefficients which are previously calculated (see col. 9 lines 56 – 60 – B exp(j) phi is the discriminative coefficients which are previously calculated, which are previously calculated, the registration fingerprint is processed before the collating finger print, see also fig 4 – 403 and 404).

With regards to claim 5, Nakajima discloses a fingerprint authentication method as claimed in claim 2, wherein said six step is done by one of an average of strength values corresponding to a predetermined spatial frequency band in the Fourier transformed image (see col. 10 lines 43 – 55 – the n pixels which are extracted from the histogram obtain from the correlation components of the Fourier image are average, the

band of pixels are the n number of pixels selected, each pixel value in n on the histogram represents how frequent the pixel occurs in the Fourier image data).

With regards to claim 6, Nakajima discloses a fingerprint authentication method as claim in claim 5, wherein said predetermined spatial frequency band includes a spatial frequency corresponding to a generic period of ridges of a human fingerprint (the ridges on the human fingerprint occurs periodically, so in the frequency domain there must be frequency values which represents the periodicity of the spatial domain signal, see fig 1A to fig 2B – fig 2B is the Fourier representation of image in fig 1A).

With regards to claim 8, Nakajima discloses a fingerprint authentication method as claimed in claim 2, wherein said six step is done by the use of dispersion of strength values corresponding to a predetermined spatial frequency band in the Fourier transformed image (see col. 10 lines 43 – 55 – the n pixels which are extracted from the histogram obtain from the correlation components of the Fourier image are average, the band of pixels are the n number of pixels selected, each pixel value in n on the histogram represents how frequent the pixel occurs in the Fourier image data, in addition, the histogram represents the dispersion or scattering values around the mean and median).

With regards to claim 9, Nakajima discloses a fingerprint authentication method as claim in claim 8, wherein said predetermined spatial frequency band includes a spatial

frequency corresponding to a generic period of ridges of a human fingerprint (the ridges on the human fingerprint occurs periodically, so in the frequency domain there must be frequency values which represents the periodicity of the spatial domain signal, see fig 1A to fig 2B – fig 2B is the Fourier representation of image in fig 1A).

With regards to claim 11, Nakajima discloses all of the claim elements / features as discussed above in rejection for claim 2 and incorporated herein by reference, but fails to disclose requesting user to input fingerprint image again are when input data is not proper. Bjorn discloses a step of requesting the user to input the fingerprint once more when decision that the input data are not proper (see fig 5 – 515, 520 – when there is no fingerprint present the system will try to recapture image from the user). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to include requesting user to input fingerprint image again are when input data is not proper because to ensure the system to capture a fingerprint image which are present on the imager and properly align, so to prevent any miss match error in the authentication process.

With regards to claims 12 and 23, see the rationale and rejection for claim 1.

With regards to claims 13 and 24, see the rationale and rejection for claim 2.

With regards to claims 14 and 25, see the rationale and rejection for claim 3.

With regards to claims 16 and 27, see the rationale and rejection for claim 5.

With regards to claims 17 and 28, see the rationale and rejection for claim 6.

With regards to claims 19 and 30, see the rationale and rejection for claim 8.

With regards to claims 20 and 31, see the rationale and rejection for claim 9.

With regards to claims 22 and 33, see the rationale and rejection for claim 11.

3. Claims 4, 7, 10, 15, 18, 21, 26, 29 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima (US pat no 6,094,499) in view of Bjorn (US pub no 2001/0040987) as applied to claims 2, 5 and 8 further in view of Modl (US pat no 6,782,120).

With regards to claim 4, Nakajima discloses all of the claim elements / features as discussed above in rejection for claim 2 and incorporated herein by reference, but fails to disclose finding fingerprint center and fingertip direction. Modl discloses a step of finding a fingerprint center (see col. 3 lines 24 – 26) and a fingertip direction (see col.3 lines 26 – 29 and col. 4 lines 21 – 24 – when forming segmented areas, the system must be able to find the fingertip of the fingerprint, the tip of the finger are the delta

points) and a step assuming five-sided polygon as an observation area on the fingerprint image on the basis of the fingerprint center and fingertip direction (see figure center of the image shows a polygon with 5 sides). Selecting the shape of the observational area is a matter of choice, any shape window will enough, as the shape of the observational window does not have any significant impact on the current invention. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to include finding fingerprint center and fingertip direction because those areas contains the origin points where fingerprint images can be compare with other fingerprint image, by use of pixel to pixel matching, fingerprint image correlation, or any matching method, so the identification of the person trying to access a secure area can be matched.

With regards to claim 7, Nakajima discloses all of the claim elements / features as discussed above in rejection for claim 2 and incorporated herein by reference, but fails to disclose spatial frequency corresponding to a generic period of ridges of a periodic structure caused by sweat glands. Modl discloses spatial frequency includes a spatial frequency corresponding to a generic period of a periodic structure caused by sweat glands of human finger (see col. 4 lines 36 – 44 – the sweat pores are located on the sweat glands). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to include structures of sweat glands on human finger because to add an addition feature, which can be use for identifying individual or image matching, to increase security.

With regards to claims 10, 21 and 29, see the rationale and rejection for claim 7.

With regards to claims 15 and 26, see the rationale and rejection for claim 4.

With regards to claims 18 and 32, see the rationale and rejection for claim 7.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex Liew whose telephone number is (571)272-8623. The examiner can normally be reached on 9:30AM - 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (571)272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alex Liew
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1/6/07